Abacus

The abacus is a computing device in which arithmetic calculations are performed by sliding counters (beads, pebbles, or flat disks) along rods or wires, or in grooves.

Originally, the term was applied to lined boards on which calculations were performed by moving pebbles or counters; nowadays these are usually referred to as counting boards (sometimes counter-boards or reckoning-boards) and the term "abacus" is restricted to the above later meaning assigned to it. The numeral frames often found in elementary schools or on cribs and play-pens are a form of abacus.

Counting boards, known since antiquity and widely used until modern times, can be found in only a few museums now. Frame-type abaci are still used in many parts of the world, however. Most familiar are the Chinese, Japanese and Russian forms of abacus.

The Chinese and the Japanese abacus each consists of a frame with a cross-bar having rods that carry counters both above and below the cross-bar. The Chinese abacus (suan-p'an) has two counters on each rod above the cross-bar and five below. The contemporary Japanese abacus (soroban) has one counter on each rod above the cross-bar and four below; older Japanese devices have five counters below the cross-bar.

In any calculation only those counters are counted which are moved against the bar. Each counter above the cross-bar has a value of 5; each counter below the bar has a value of 1. The right-most column contains units; the next one, tens; the next, hundreds, and so on.

The Russian abacus (tchoty) and the Western educational numeral frames have no cross-bar. Here most rods contain 10 counters; occasionally a rod has fewer, for fractions.

REFERENCES:

Barnard, F.P. The Casting-counter and the Counting-board. Oxford: Oxford University Press, 1916.

This is the major English-language work on the subject, long out of print.

*/ Crook, Welton J. Abacus Arithmetic. Palo Alto: Pacific Books, 1958. 69pp.

The author shows how to perform addition, subtraction, multiplication, division and extraction of square and cube roots on the Chinese abacus.

*/ Kojima, Takashi. Advanced Abacus. Japanese Theory and Practice. Rutland, Vt.: Charles E. Tuttle, 1963.

Topics covered include history, work with negative numbers, variant methods of multiplication, division and root extraction, calculation with different measurements. Exercises include those used in Japanese abacus license examinations held under the auspices of the Japanese Chamber of Commerce and Industry.

* Menninger, Karl. Number Words and Number Symbols. A Cultural History of Numbers. Translated from the German by Paul Broneer. Cambridge, Mass.: M.I.T.Press, 1969.

Pp. 295-388 deal with the history and use of the abacus, counters and counting boards.

* Pullan, J.M. The History of the Abacus. New York: Praeger, 1970.

The author primarily deals with the tradition of counters and counting boards in Western Europe.

*/ Yoshino, Yozo. The Japanese Abacus Explained. With an introduction by Martin Gardner. New York: Dover, 1963. xiii+240pp.

Discusses performance of basic four arithmetic operations on soroban (1-5).

* denotes books in print (1980-1981).
/ denotes books available in paperback (1980-1981)

SELECTED PHOTOGRAPHS OF ABACI IN THE NATIONAL MUSEUM OF AMERICAN HISTORY

CAT. NO.	NEG. NO.	TYPE	PLACES
309527	T19876	suan-p'an (2-5)	15
316866	T58997A	soroban (1-5)	21
335269	79-10143	tchoty	9
335485	79-10365	soroban (1-4)	23
79.693.01	80-02513	numeral frame	8

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